

PART 2: APS USER ORIENTATION (APS 101) STUDY GUIDE

This study guide provides the following information:

- Argonne and APS policies and emergency procedures you will be expected to follow
- information that will enable you to work safely at the APS
- an overall description of the APS Personnel Safety System (an engineered electronic interlock system designed to protect personnel against radiation exposure in the APS experiment hall)

1.0 ARGONNE NATIONAL LABORATORY EMERGENCY PROCEDURES AND POLICIES

1.1 REPORTING EMERGENCIES

To report an emergency from any Argonne telephone, dial 911 and stay on the line until you are instructed to hang up. If you are using a cellular/mobile phone, dial 630.252.1911.

When asked about your location, if you are using an Argonne phone, look at the 911 sticker (see photo). The building and room number are listed there. Dialing 911 initiates a group alerting system that involves the fire, security, and medical departments, among others. As soon as it is safe to do so, inform your host Collaborative Access Team (CAT) about the emergency.



1.2 SITE ALARMS AND WARNINGS

Several types of emergency notification systems are used at Argonne: outdoor sirens, the public address system warning tone and voice announcements, and building alarms. Sirens and the public address system warning tones are tested on the first Tuesday of each month at 10:00 a.m.

Tornado warnings are announced indoors by voice over the site-wide public address system; outdoors, sirens are sounded when tornado warnings are issued. When you hear the warning, go immediately to a designated tornado shelter.* If you are outdoors and hear the siren, seek shelter.

To find the nearest shelter,
follow signs such as this:



Take shelter in an area indicated by a
sign that looks like this:



* Designated tornado shelters at the APS can be found in the following areas:

- in the central "C" pentagon of each laboratory/office module (LOM)
- in the central laboratory/office (CLO) building
- in the APS conference center
- in the Argonne Guest House



1.3 FIRES

In the event of a fire, go immediately to a safe place, dial 911 from an Argonne telephone or 630.252.1911 from a cellular/mobile telephone and stay on the line until you are told to hang up.

The locations of fire extinguishers at the APS will be pointed out during your sector-specific orientation. (If a small, contained fire occurs, you may use a fire extinguisher to put it out if you have been properly trained. Once all danger has been eliminated, call 911 so that the extinguisher can be replaced.) Wall-mounted pull alarms are located near exit doors throughout the APS and should be used to alert personnel of a fire if no audible alarm is sounding.

Be sure you can identify exit routes from the area where you will be working.

- Each LOM has six emergency-only exits.
- Doors from the experiment hall into the LOMs are located at the downstream ends of the beamlines.
- Beamline exit routes including beamline "duck-unders" (see photo) are designated by yellow lines on the floor.



When leaving a building in response to an alarm, avoid blocking exit routes and roadways. For information and instruction on when it is safe to return to the building, look for an Area Emergency Supervisor (AES) wearing an orange cap with the letters AES on it.



1.4 INJURIES AND ILLNESSES



If anyone in your vicinity at the APS suffers an injury or acute illness, dial 911 from an Argonne telephone or 630.252.1911 from a cellular/mobile telephone (24 hours a day) and stay on the line until you are told to hang up. After you hang up, notify someone from your host CAT and an APS floor coordinator. Argonne paramedics will respond and transport the injured or ill person to the nearest hospital emergency room or to the Argonne medical department, as the situation warrants.

Be aware that if you are the injured or ill person, emergency health care at an off-site facility is your financial responsibility. It is important for you to be familiar with the terms of your insurance coverage and your employer's coverage for occupational illnesses and injuries. Be sure you have your insurance card, health maintenance organization card, or other proof of insurance with you during your stay at the APS. (If you do not have medical coverage, short-term medical insurance can be arranged; contact the APS User Office.)

For non-emergency illnesses or injuries, go to the Argonne Medical Department, Building 201, during sick-call hours (Monday through Friday, from 10:30 a.m. to 12:00 noon and from 3:00 p.m. to 4:30 p.m.). Medical Department staff will either treat you or refer you to an appropriate off-site facility.



1.5 SECURITY

Argonne places a very high priority on health and safety in the workplace. Therefore, you may not bring any of the following items on site: firearms or other weapons, pepper spray, explosive or incendiary devices, or illegal drugs. Specific authorization is required to bring in or take out hazardous material (including radioactive materials). Argonne reserves the right to inspect incoming or outgoing personnel or vehicles for prohibited material and/or government property. Therefore, any equipment or material owned by you or your institution should be clearly tagged. For more specific guidance, contact your host CAT.



Argonne policy specifically prohibits the manufacture, distribution, sale, possession, use, or abuse of illegal or illegally obtained drugs on the Argonne site. Alcohol may be consumed only in the Argonne Guest House dining room or at approved Argonne functions. Visitors may bring alcohol onto the Argonne site only if it is kept in a closed container and consumed in Argonne's housing facilities. For further clarification, contact the APS User Office.

Security at Argonne is handled by the Argonne Protective Force, uniformed guards who are on site 24 hours per day, seven days a week. In emergencies, they can be reached by dialing 911 from any Argonne telephone or 630.252.1911 from a cellular/mobile telephone. For non-emergencies, the protective force can be reached at 2-5730 from an Argonne phone. Suspicious activities (theft, destruction of property, vandalism, criminal activity) should be reported to an APS User Office staff member or an APS floor coordinator, who will make sure that the Argonne Security Department is notified.



1.6 VEHICLE SAFETY AND PARKING

The Illinois Motor Vehicle Code applies at the Argonne site. Vehicle operators must have a valid driver's license or instruction permit, obey traffic signs and signals, have liability insurance, be alert for road hazards, and yield the right of way to pedestrians who are crossing at marked crosswalks.

On-site speed limits are as follows:

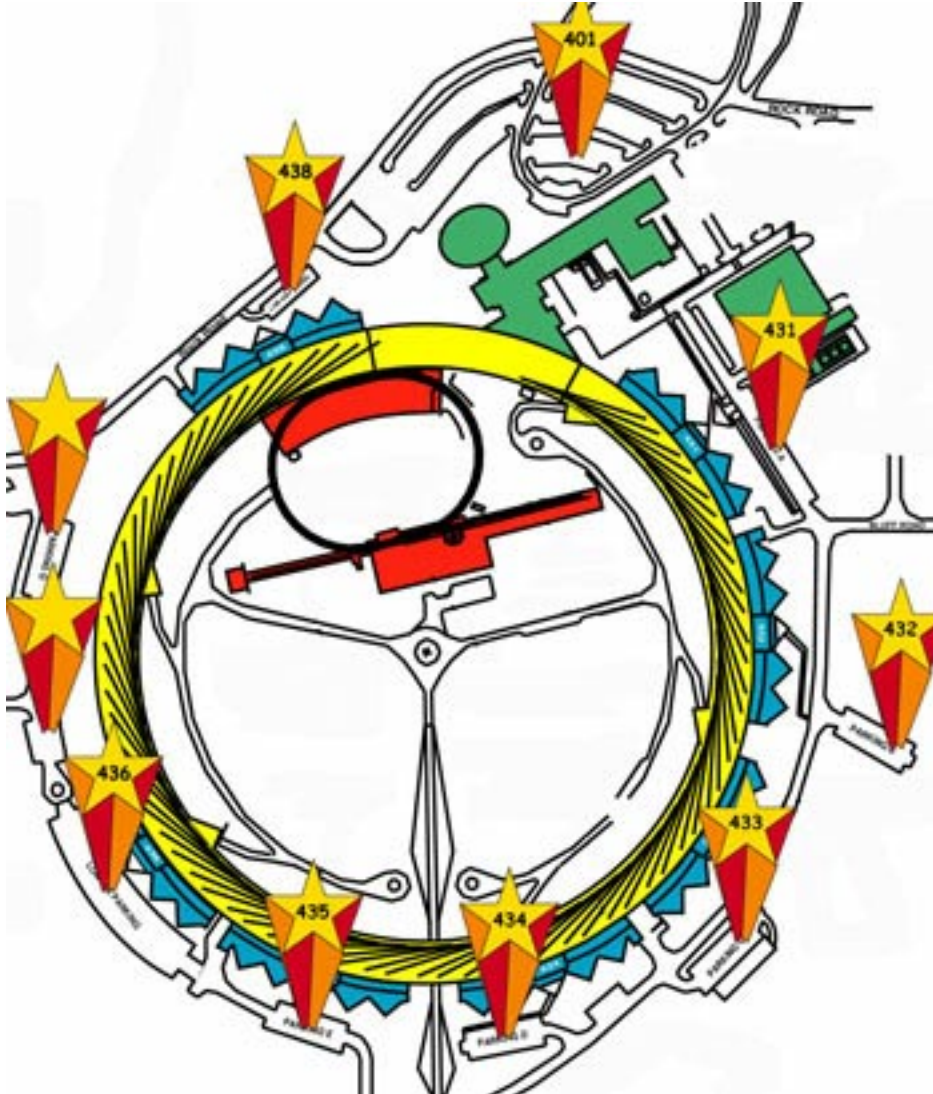
- Near entrances: 15 mph (24 km/h)
- All other locations: 30 mph (48 km/h)

These limits are strictly enforced by the Argonne Protective Force! Violations are reported to your host CAT Director.



Deer can pose a traffic hazard at Argonne and in the surrounding area. These animals roam the site, sometimes in herds, crossing roads without warning. Be alert at all times and **SLOW DOWN** when you see deer near the edge of the road.

Park only in marked parking spaces. Parking is prohibited at building loading/receiving docks, in spaces designated for the handicapped (unless the vehicle has properly displayed authorization), within 15 ft (4.6 m) of a fire hydrant, in fire lanes, and in reserved spaces. Parking lots for APS users at the APS site are shown below.



1.7 COMPUTER PROTECTION

APS users are expected to comply with Argonne's computer protection policies and practices. Briefly, these policies specify that you must identify and protect sensitive information and computer applications, follow appropriate back-up procedures, and prevent any unauthorized use of Argonne computing and network resources. Each CAT has a designated computer protection program representative. Any suspected compromise of computer security should be immediately reported to your host CAT.



1.8 SMOKING



At Argonne, smoking is prohibited in all public areas such as hallways, conference rooms, libraries, washrooms, elevators, stairwells, lobbies, the Argonne cafeteria, and the Argonne Guest House dining room. At the APS, smoking is prohibited in all buildings, including the experiment hall, central laboratory/office building, and the laboratory/office modules.



2.0 APS SAFETY INFORMATION

At the APS, safety is EVERYONE'S responsibility. As such, it plays an integral role in the planning, review, and execution of all activities, including your work here. Accordingly, if you see any work being conducted that you believe may put you or others in immediate danger, you have the right and the obligation to stop the work and bring the situation to the immediate attention of your host CAT and a floor coordinator. If you are asked to stop work, you must do so.

The following information will acquaint you with specific safety precautions at the APS.

2.1 PROPER ATTIRE IN THE EXPERIMENT HALL

Proper attire for work in the experiment hall includes closed-toes, covered-heel shoes and long pants. Sandals are not acceptable. Skirts may be worn if a lab coat is also worn.

To enter a construction area, you must wear appropriate clothing and safety equipment. The posted entry requirements could include some or all of the following:

- Safety glasses with side shields
- A hard hat
- Leather safety shoes, preferably ones that cover the ankle
- Long pants
- A shirt with sleeves



2.2 RESTRICTED AREAS

At the APS, you may encounter restricted areas where construction or maintenance work is in progress. The perimeter of these areas is marked with rope or barricade tape

If you need to enter these areas, you must be authorized by the person in charge of the work area and adhere to all posted entry requirements (e.g., "Hard Hats Required").



2.3 PEDESTRIANS

Pedestrians in the experiment hall share the walkways with a variety of motorized/moving vehicles (e.g., forklifts, scissor lifts, and tricycles). Pedestrians must exercise caution and look in both directions before stepping into a walkway from the laboratory/office modules or beamline areas.



2.4 HOISTING AND RIGGING

You may use the hoists located in the experiment stations at the APS only with authorization and training from your host CAT.

If you need help lifting or moving heavy objects, the APS can provide the services of professional riggers. Ask your host CAT to make these arrangements for you.

2.5 PROTECTION FROM FALLS

If you are working from a surface with an elevation of six feet or greater, fall protection is required. Your host CAT will provide further guidance.

2.6 WORKING IN EXPERIMENT ENCLOSURES AND WORKING ALONE

According to APS policy, you are not allowed to be in any experiment station with the doors closed. Also, when activities anywhere at the APS involve significant hazards, you are not permitted to work alone; you must remain in sight and sound of a second person who understands the work being performed and knows all pertinent emergency procedures. If you will be working alone conducting non-hazardous activities, make sure that someone from your host CAT is aware that you will be doing so.



2.7 USER MACHINE SHOPS

A small machine shop adequately equipped to meet immediate experimental needs is located in each LOM. To use the tools in the shop, you must have proper qualifications and obtain authorization from your host CAT. To qualify, you must do all of the following:

- Demonstrate proficiency in operating the machines you will need to use
- Receive an orientation to the shop from your host CAT
- Have your CAT's LOM shop coordinator place your name on the authorized user list

As an authorized machine shop user, you must

- Wear specified personal protective equipment, such as safety glasses with side shields
- Obey all safety postings
- Do your part to keep the shop clean and orderly



2.8 CHEMICAL SAFETY

The APS and the CATs have worked together to implement a system for controlling risks arising from the storage, use, and transport of hazardous chemicals. This system recognizes your right to know the identity of chemicals to which you might be exposed, as well as the hazards associated with them. It also requires you to provide, through your CAT safety coordinator, information needed for your own safety and the safety of others.

As a user, you must

- Know how to manage hazards posed by the substances you use
- Ensure that relevant hazard information is immediately available at the APS
- Follow your host CAT's safety plan



Chemical Inventory. Each CAT maintains a record of the chemicals used in its laboratory/office module and at the beamlines. You have the right to view this record and the obligation to fully describe any chemicals (and their hazards) that you bring with you or have shipped to the APS.

You may also request information on chemicals used by other CATs. These requests should be addressed to an APS floor coordinator or the APS User Safety Coordinator, Bruce Glagola, who can be reached at 630.252.9797



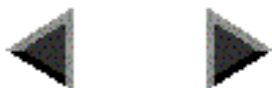
Material Safety Data Sheets. Each CAT is required to maintain material safety data sheets (MSDSs) for all industrial and reagent chemicals stored or used at the APS. The MSDSs are generally kept in a binder in a rack outside one of the LOM laboratories, as shown in the photograph.



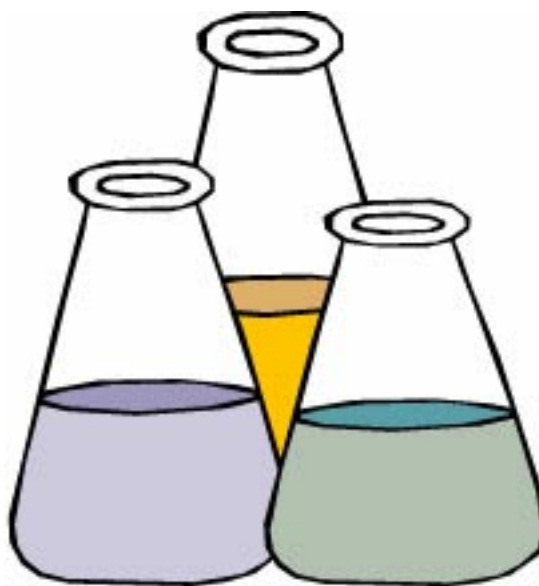
Experimental Samples. Known hazards of any materials, including experimental samples, that you ship or bring to the APS must be described on the Experiment Safety Approval Form (ESAF) that you must complete prior to any scheduled beam time. Each CAT will ensure that hazard information for experimental samples is immediately available.

Transportation of Hazardous Materials. The transportation of any hazardous material on the Argonne site must be in accordance with Argonne requirements. Contact your host CAT for guidance.

Container Labeling. All reagent chemical containers must be labeled with the name of the reagent as it appears on the MSDS, appropriate hazard warnings, and the name of the person who is responsible for the container. In addition, if a chemical is peroxidizable, or otherwise becomes more dangerous with age, a "discard by" date must appear on the container.



Acquisition and Disposal of Hazardous Chemicals. The APS has several common solvents (isopropyl alcohol, ethyl alcohol, methyl alcohol, and acetone) available at Argonne so you won't have to transport them from your home institution. (You may, however, have them shipped to you directly at the APS from the vendor. Shipping information is available in Part 1 of this guide or from your host CAT.) The APS also has procedures in place for the disposal of hazardous chemicals so that you won't have to take them back to your home institution for disposal. Please inform your host CAT of any wastes you expect to generate.



2.9 RADIATION SAFETY

Dosimeters. Although past measurements in the APS experiment hall show that the expected radiation dose to persons is negligible or zero, a dosimeter is still required for entry. Depending on the frequency and duration of your visits to the APS, you will be issued either a permanent or visitor dosimeter. A dosimeter rack is located in the central pentagon ("C") of your host CAT's LOM. Permanent dosimeters are stored in assigned slots in the rack.

Visitor dosimeters can be obtained from the User Office or a floor coordinator. At the end of your visit, return your visitor dosimeter to the visitor box on top of the dosimeter rack. **Always wear the dosimeter while you are in the APS experiment hall, but DO NOT remove it from the Argonne site.**



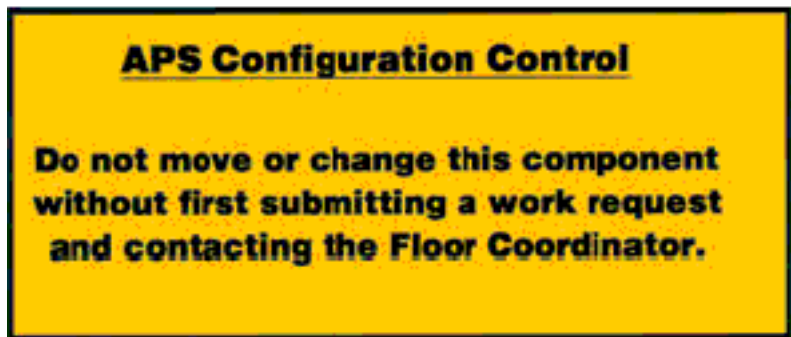
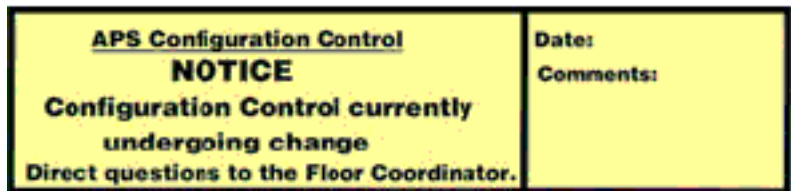
Posted Requirements. Some areas may be posted with additional restrictions for entry because of potential radiation hazards. You are required to obey all such postings.

Radioactive Sources and Samples. The use of low-activity sealed sources, which are typically used for calibration purposes, is restricted. Your host CAT's safety coordinator or APS floor coordinator can give you information on the procedures for using calibration sources. Contact your host CAT for guidance in handling other sources of radioactivity, including radioactive samples.



Configuration Control. Configuration controls are administrative policies and procedures that govern the placement of critical beamline components that serve to protect personnel from radiation exposure. These components are marked by signs and **MUST NOT** be moved unless a configuration control work permit has been completed and posted. Contact your host CAT for guidance.

Any person who tampers with configuration-controlled components or makes an unauthorized and deliberate attempt to circumvent a radiation-exposure-protection system may be denied access to the APS facility and could, potentially, be subject to criminal prosecution. In addition, the beamline will be taken off line until a formal review is completed.



Lasers. If your experiment will involve Class 3 or 4 lasers, you need to be aware that the use of these lasers requires training and an approved experimental design that includes written procedures. See [Safety Guide 4-1: Laser Hazards for Classes 3 and 4](#) for further information. In addition, you must obtain and complete a Laser Facility Checklist from the Argonne Laser Safety Officer. Bruce Glagola, APS User Safety Coordinator (630.252.9797; glagola@aps.anl.gov), can provide additional details.

The importance of adhering to ALL radiological safety precautions, including the wearing of dosimeters, cannot be overstated. Nonconformance may result in severe sanctions for the APS and its users under the Price-Anderson Amendments Act.



2.10 ELECTRICAL SAFETY

Both Argonne and the APS strongly emphasize electrical safety awareness. When working at the APS, you must comply with Argonne's electrical safety practices as outlined in the [Argonne Environment, Safety, and Health Manual](#).

Equipment. Commercially manufactured equipment that has been approved by nationally recognized testing laboratories may be brought to the APS, but you must notify your host CAT in advance on your Experiment Safety Approval Form (see section 2.11). Non-commercial equipment, including significantly modified commercially manufactured equipment, must have appropriate engineered safeguards and must also be reported to your host CAT and made available for inspection and testing.



2.11 EXPERIMENT SAFETY REVIEW

- Before you arrange your trip to the APS, you must complete an Experiment Safety Approval Form (ESAF) according to the procedures outlined by your host CAT.
- Your host CAT must review all commissioning and experimental activities you plan to carry out at the APS.
- Reviews are done to identify an appropriate combination of engineering and procedural hazard controls to maintain a safe working environment.
- The Experiment Safety Approval Form (ESAF) documents the review and approval process and must be posted at the beamline BEFORE any experiment can begin.
- All user activities must be performed in accordance with the safety requirements designated on the ESAF.



2.12 THE APS PERSONNEL SAFETY SYSTEM

Maintaining a safe work environment for users is a top priority at the APS. An important component of the APS' safety system is the PSS, or Personnel Safety System. The PSS is a reliable, redundant, fail-safe system that prevents radiation exposure.

Because every CAT beamline and experiment station is unique, the specific features and details of the beamline where you will work will be explained to you during your sector-specific orientation.

The following important points are common to all Personnel Safety Systems:

1. Search and Secure

A "Search and Secure" procedure--to ensure that no person remains in the station after the door is closed--must be conducted before beam will be allowed into the station. You must remember that only ONE person can conduct a search and secure at a time. You will be taught how to conduct a Search and Secure during your sector-specific orientation.

2. Emergency Beam Stop and Door Disable Buttons

APS policy dictates that NO ONE is allowed inside a station with the doors closed at any time. **In the unlikely event that you are ever left in a station with the doors closed, the first thing you should do is press the red Emergency Beam Stop button.** This action will prevent any beam from entering the station.



To open a pneumatic station door that has a magnetic locking system and leave the station, push the DOOR OPEN button--automatic doors should slide open. If the door does not automatically open at that point, push the DOOR DISABLE button, which will dissipate any remaining air pressure. You will then be able to push the door open